

## Lifetime Certificate for E650 ZMD3.. ZMD4.. Family

### 1 | General

Test conditions: 1000 h 85degC/85 % r.h., according to D000039216, "Steady-State Damp-Heat Highly Accelerated Lifetime Test (HALT) for Electricity Meters", L+G internal test specification

Date of test and assessment completion: 19<sup>rd</sup> April 2012

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Passing this accelerated lifetime test guarantees an average lifetime of the meters in excess of 15 years (Hallberg-Peck model) under standard environmental conditions (25 degC and 60% r.h).

### 2 | Tested meters

ZMD405CT44.0607 S3 B31  
(with B32 HW)  
Series nr.: 99 720 769..773

cl. 0.5s/1      3x230/400V   1(10)A   50Hz  
10'000imp/kWh/kVarh  
connection diagram: see Type-test programd

### 3 | Test and assessment procedure

Nr.	Test	Comment
1	Initial test Load curve and meter functionality/construction	
2	500h steady-state damp-heat 85°/85% r.h.	
3	Intermediate measurement: Load curve and meter functionality/construction	
4	500h steady-state damp-heat 85°/85% r.h.	
5	Final measurement: Load curve and meter functionality/construction	

#### 4 | Results

No.	Test	Loadpoint	Check	Rem.
1	Loadcurve	Program: /ZMD300_400/ ZMD405-1_10A/EZA ZMD405-1/10A 230V	Comply with error limits	i.O.
2	Stop condition	I = 0 3 x 264.5V	LED continuous on	i.O.
3	Starting condition	A: 3x1.0mA R: 3x2.0mA	LED-pulse at active and reactive energy	i.O.
4	Transmitting contacts K1 K2 K3 K4 K5 K6 K7 K8	0° 89° -89° 0 / 180° 180° -91° +91°	pulses (with beeper)	i.O.
5	Control inputs		(not parametrized = not testable)	
6	LCD-Display		Visuell	Dark <sup>1)</sup>
7	Optical interface		Readout (Daten abspeichern zum späteren Vergleich)	i.O.
8	Clock time / date		set or check	i.O.
9	RS 485		Readout Momentanwerte DLMS U,230V;I,1A;phi,0 (Daten abspeichern zum späteren Vergleich)	i.O.
10	RS 232		Readout	i.O.
11	Error message		FF = 01000000 (Battery removed)	i.O.
12	Sealing			No seal
13	Battery		Removed	No bat.

**Remarks:** 1) Display is darkened 1000h hours, but is still readable after 500 h

#### 5 | Additional testing

As the test conditions 85degC/85 exceed the operating conditions for batteries, a different test was made with meters containing batteries as follows:

Tested meters:

ZMD310CT44.4209 S3a

cl. 1/2                      3x230/400V 5(120)A 50Hz  
500imp/kWh/kVarh

Series nr.: 99 720 729..733

connection diagram: see Type-test program

Test conditions:

1000 h 70 degC I=Imax

Test results:

Batteries o.k. after 1000h 70 degC I=Imax testing

## 6 | Assessment

The inspection of the meters after 1000 h 85degC/85 % r.h. shows the following result:

- Accuracy (load curve) of all meters within class limits (Cl. 0.5 active energy according to IEC 62053-22, Cl. 1 reactive energy)
- All electronic functions performing as specified, including solid-state relays
- No mechanical/constructional deterioration
- The meter displays are not readable after 1000h 85degC/85, but are still readable after 500h. According to L+G internal specification D000045151 "Quality standard for LCD-panels", LCD-panels, which have a life time of > 15 years under standard environmental conditions, require to pass 240 h of testing at 85degC/85 % r.h., as the acceleration factor is larger for LCD-displays than for other components of the meters.

Batteries were o.k. after 1000 h 70 degC I=Imax testing.

## 7 | Conclusions

The meters of type E650 ZMD3XX/ZMD4xx family have successfully passed accelerated lifetime testing, which guarantees an average lifetime of the meter under standard environmental conditions **in excess of 15 years**.